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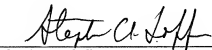
In re Application of: Jindrich Houzicka et al.

Application No.
10/663,647-Conf. #3795Filing Date
September 17, 2003Examiner
R. BoyerGroup Art Unit
1764

Invention: C7+ PARAFFIN ISOMERISATION PROCESS AND CATALYST THEREFORE

TO THE COMMISSIONER OF PATENTS:Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed: February 17, 2009.The fee for filing this Appeal Brief is \$ 540.00.☒ Large Entity ☐ Small Entity☐ A petition for extension of time is also enclosed.

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This sheet is submitted in duplicate.Stephen A. Soffen
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Jindrich Houzuvicka et al.

Application No.: 10/663,647

Confirmation No.: 3795

Filed: September 17, 2003

Art Unit: 1797

For: C7+ PARAFFIN ISOMERISATION PROCESS
AND CATALYST THEREFORE

Examiner: Randy Boyer

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Madam:

As required under § 41.37(a), this brief is filed within one month from the Notice of Panel Decision mailed on January 16, 2009, and is further to the Notice of Appeal filed on December 15, 2008.

The fees required under § 41.20(b)(2) are addressed in the accompanying
TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205.2:

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|------|-----------------------------------|
| I. | Real Party In Interest |
| II | Related Appeals and Interferences |
| III. | Status of Claims |
| IV. | Status of Amendments |
| V. | Summary of Claimed Subject Matter |

VI.	Grounds of Rejection to be Reviewed on Appeal
VII.	Argument
VIII.	Claims
Appendix A	Claims
Appendix B	Evidence
Appendix C	Related Proceedings

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Haldor Topsoe A/S, the assignee of this application.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 5 claims pending in application.

B. Current Status of Claims

1. Claims canceled: none
2. Claims withdrawn from consideration but not canceled: none
3. Claims pending: 1-5
4. Claims allowed: none
5. Claims rejected: 1-5

C. Claims On Appeal

The claims on appeal are claims 1-5.

IV. STATUS OF AMENDMENTS

Appellants did not file an Amendment after the Final Rejection dated July 31, 2008 ("Final Rejection"). Instead, Appellants filed a Pre-Appeal Brief Request for Review together with a Notice of Appeal on December 15, 2008. A Notice of Panel Decision was mailed on January 16, 2009, indicating that the application remains under appeal and that applicant is required to submit an appeal brief under 37 C.F.R. § 41.37.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In the discussion below, reference is made to the specification and drawing for exemplary embodiments of the invention covered by the claims. The specification and drawing references are not to be considered as limiting the scope of the invention as defined by the claims.

The claimed invention relates to a catalytic process for the production of high-octane gasoline from a hydrocarbon feed stream comprising C_{4+} hydrocarbons cuts in presence of a catalyst composition (application at 1, ll. 3-6). According to claim 1 of the application, the process includes the step of "contacting the feed under isomerisation conditions with a catalyst composition consisting of mixed aluminium and zirconium oxides modified with tungsten oxyanion and platinum and/or palladium" (application at 3, ll. 21-24; at 4, ll. 4-9; at 6, ll. 7-11). In this manner, "the catalyst of the invention exhibits higher yield of multi-branched isomers and significantly lower cracking activity" (application at 11, ll. 13-15; Examples 4 and 5).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether the rejection of claims 1-5 under 35 U.S.C. §103(a) as being unpatentable over Chang (U.S. Patent No. 6,080,904) in view of J. C. Yori et al., *Isomerization of n-Butane on Pt/SO_4^{2-} -ZrO₂ and Mechanical Mixtures of $Pt/Al_2O_3 + SO_4^{2-}$ -ZrO₂*, 153 J. CATAL. 218-223 (1995) should be reversed.

Whether the rejection of claims 1-5 under 35 U.S.C. §103(a) as being unpatentable over S. Zhang et al., *Anion-Modified Zirconia: Effect of Metal Promotion and Hydrogen Reduction on*

Hydroisomerization of n-Hexadecane and Fischer-Tropsch Waxes, 69 FUEL PROC. TECH. 59-71 (2001) in view of J. C. Yori et al., *Isomerization of n-Butane on Pt/SO₄²⁻-ZrO₂ and Mechanical Mixtures of Pt/Al₂O₃ + SO₄²⁻-ZrO₂*, 153 J. CATAL. 218-223 (1995) should be reversed.

VII. ARGUMENT

Claims 1-5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chang (U.S. Patent No. 6,080,904) (“Chang”) in view of J. C. Yori et al., *Isomerization of n-Butane on Pt/SO₄²⁻-ZrO₂ and Mechanical Mixtures of Pt/Al₂O₃ + SO₄²⁻-ZrO₂*, 153 J. CATAL. 218-223 (1995) (“Yori”). Claims 1-5 are also rejected under 35 U.S.C. §103(a) as being unpatentable over S. Zhang et al., *Anion-Modified Zirconia: Effect of Metal Promotion and Hydrogen Reduction on Hydroisomerization of n-Hexadecane and Fischer-Tropsch Waxes*, 69 FUEL PROC. TECH. 59-71 (2001) (“Zhang”) in view of Yori. These rejections are respectfully traversed for at least two reasons: (i) the cited prior art references do not disclose or suggest all limitations of claims 1-5; and (ii) a person of ordinary skill in the art would not have been motivated to combine the cited prior art references, to arrive at the claimed subject matter.

THE CITED PRIOR ART REFERENCES DO NOT DISCLOSE OR SUGGEST ALL LIMITATIONS OF THE CLAIMED INVENTION

At the outset, Appellants point out that claim 1 does not recite the fully open term “comprising” but rather the narrower, closed term “consisting of” to better reflect that the four specified components (i.e., aluminum oxide, zirconium oxide, tungsten oxyanion, and platinum and/or palladium) are essential, rather than incidental. The “consisting of” language limits the catalyst composition to the specified components.

Chang and Yori (considered alone or in combination), and Zhang and Yori (considered alone or in combination) simply do not disclose or suggest all “essential” elements of independent claim 1, i.e., a catalyst composition “consisting of mixed aluminum and zirconium oxides modified with tungsten oxyanion and platinum and/or palladium.” Chang and Zhang are silent about a catalyst composition containing aluminum. Zhang compares a tungstated zirconia catalyst

promoted with platinum for use in hydroisomerization and hydrocracking of Fischer-Tropsch waxes with a sulphated zirconia platinum catalyst. The catalysts show different activities and product composition (see page 65, 3.3 in Fuel processing Technology 69 (2001)). Similar to Zhang, Chang discloses an isomerization catalyst consisting of zirconia, modified with tungstate and platinum. According to Chang, such catalyst does not need to contain any sulphate ion and is more stable than sulphated catalysts, such as a superacid sulphated catalyst (col.6, lines 28-34 of Chang).

Yori fails to address the deficiencies of Chang and Zhang. Yori mentions indeed platinum/alumina; however, this platinum/alumina is mixed with sulphated zirconia to form a sulphated catalyst, which is a completely different catalyst from that of the claimed invention and also from the catalysts of the above-cited prior art references (tungstated zirconia is not present). The catalyst composition of the process of the claimed invention is not sulphated. In fact, Yori *teaches away* from a catalyst composition consisting of platinum/aluminum, because the activity and selectivity of pure platinum/alumina are very low, whereas the addition of sulphated zirconia gives a better stability and enhances the conversion of n-C₄ (see page 222, left column, second paragraph to right column, second paragraph, in Yori, Journal of Catalysis 153, (1995)).

The Examiner's assertion in the Final Rejection that the addition of Pt/alumina to the $\text{SO}_4^{2-}\text{-ZrO}_2$ compound of Yori would have the same effect as if Pt/alumina were added to the catalyst of Chang (to provide a useful isomerisation catalyst as recited in claims 1-5) is unsupported. Again, Yori does not disclose or suggest the addition of aluminum to a composition of zirconium oxide modified with tungsten oxyanion. Rather, Yori teaches addition of alumina to $\text{SO}_4^{2-}\text{-ZrO}_2$, which is a compound completely different from zirconium oxide modified with tungsten oxyanion. In addition, as "catalytic phenomena and chemical reactions are unpredictable" (see *In re Jules Mercier*, 515 F.2d 1161 (Fed. Cir. 1975)), it is neither predictable nor obvious that the addition of one metal (selected from known catalytic materials) to a different catalytic material (as asserted by the Examiner) will retain similar properties when being incorporated in the other catalytic material.

NO MOTIVATION TO COMBINE THE REFERENCES EXISTS

Appellants further submit that a person of ordinary skill in the art would not have been motivated to combine Chang with Yori and Zhang, in the manner detailed in the Final Rejection.

The Supreme Court has recently held that “[t]o determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple patents; to the effects of demands known to the design community or present in the marketplace; and to the background knowledge possessed by a person having ordinary skill in the art” and that “[t]o facilitate review, this analysis should be made explicit.” *KSR Int’l Co. v. Teleflex Inc.*, 2007 U.S. LEXIS 4745, 9-10 (U.S. 2007). Further, it is the policy of the United States Patent and Trademark Office that “in formulating a rejection under 35 U.S.C. 5 103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.” *USPTO KSR Memo*, from Margaret A. Focarino, Deputy Commissioner for Patent Operations to Technology Center Directors, May 3, 2007. The Final Rejection failed to provide such a reason.

In the Final Rejection, the Examiner states that “the alumina (aluminum oxide) of Yori would be added to the catalyst compositions of Chang and Zhang (both comprising Pt and zirconium oxide) to yield a catalyst composition such as that claimed by Applicant” because “from a complete reading of Yori, it is clear that the increased conversion noted by Yori is attributable to the added aluminum oxide” (Final Rejection at 8). Appellants disagree for at least the following three reasons:

First, Yori does not disclose or suggest the addition of aluminum to a composition of zirconium oxide modified with tungsten oxyanion. Rather, Yori teaches addition of alumina to a sulphate compound (i.e., $\text{SO}_4^{2-}\text{-ZrO}_2$), which is a compound completely different from zirconium oxide modified with tungsten oxyanion. Thus, even if any “increased conversion noted by Yori” could be attributable to the added aluminum oxide (as the Examiner asserts), this increased

conversion is irrelevant since the addition of alumina pertains to a sulphate compound, and not to a composition of zirconium oxide modified with tungsten oxyanion.

Second, Yori states that Pt/aluminum has a pure activity and selectively in the isomerisation of C_{4+} (page 222, second paragraph). Accordingly, even if a person of ordinary skill in the art would *arguendo* have been motivated to combine Yori with either Chang or Zhang, one skilled in the art would not expect an enhanced catalytic activity by adding aluminum to the catalyst of Chang or Zhang. Thus, a person of ordinary skill in the art would not have been motivated to combine the references.

Third, Appellants submit that courts have recognized that “catalytic phenomena and chemical reactions are unpredictable.” See *In re Jules Mercier*, 515 F.2d 1161 (Fed. Cir. 1975). The Federal Circuit specifically emphasized that:

The board’s approach amounts, in substance, to nothing more than a hindsight ‘reconstruction’ of the claimed invention by relying on isolated teachings of the prior art without considering the over-all context within which those teachings are presented. Without the benefit of appellant’s disclosure, a person having ordinary skill in the art would not know what portions of the disclosure of the reference to consider and what portions to disregard as irrelevant, or misleading.

In re Jules Mercier, 515 F.2d 1161 (Fed. Cir. 1975)

It is neither predictable nor obvious that the addition of one metal (selected from known catalytic materials) to a different catalytic material (as asserted by the Examiner) will retain similar properties when being incorporated in the other catalytic material. No conclusion about the effect of a specific metal compound on stability, activity and selectivity of a catalyst composition can be made by simply adding the metal present in one catalyst composition to a different catalyst composition. Consequently, a person skilled in the art would not have been motivated to incorporate alumina in the platinum-based zirconium oxide catalyst.

For at least the reasons, the Final Rejection failed to establish a *prima facie* case of obviousness, and reversal of the rejection of claims 1-5 is respectfully solicited.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A. As indicated above, the claims in Appendix A include the amendments filed by Applicant on June 11, 2008

Dated: February 17, 2009

Respectfully submitted,

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 10/663,647:

1. (Previously presented) A process for the production of high-octane gasoline from a hydrocarbon feed stream with C_{4+} hydrocarbons cuts comprising contacting the feed under isomerisation conditions with a catalyst composition consisting of mixed aluminium and zirconium oxides modified with tungsten oxyanion and platinum and/or palladium.

2. (Original) A process according to claim 1, wherein the hydrocarbon feed contains at least 20 wt % of C_{7+} hydrocarbons.

3. (Previously presented) A process according to claim 1, wherein the isomerisation conditions comprise presence of hydrogen with a hydrogen to hydrocarbon molar ratio between 0.1 to 5, a temperature range from 150 °C to 300 °C, a total pressure of between 1 and 40 bar and a liquid space velocity LHSV of between 0.1 to 30 h^{-1} .

4. (Previously presented) A process according to claim 1, wherein the catalyst composition in its dry form comprises 10-50 wt % of tungsten oxide, 10-40 % of aluminium oxide and a remainder of zirconia and Group VIII metal.

5. (Previously presented) A process according to claim 1, wherein the platinum and/or palladium is in an amount of between 0.01 wt % to 5 wt %.

APPENDIX B

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

APPENDIX C

No related proceedings are referenced in Section II. above, hence copies of decisions in related proceedings are not provided.